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DATE

EMBRYOLOGY FINAL EXAMINATION - 1995

SELECT THE SINGLE BEST ANSWER

1. Match adult derivatives and vestigial remains with the embryonic structures (an answer maybe used more than once):

A. Urogenital sinus
B. Mesonephric tubules
C. Mesonephric (Wolffian) duct
D. Paramesonephric (Müllerian) duct
E. None of the above

(A) 2. Lower vagina

(A) 3. Prostate gland - Urogenital Sinus outgrows from urethra.

(C) 4. Seminal vesicle - Mesonephric duct

(B) 5. Uterine tube

(B) 6. Epoophoron

(C) 7. Ureteric bud (metanephric diverticulum)

8. Bowman's capsule is derived from which of the following embryonic structures?

(A) Renal vesicle
B. Glomerulus
C. Ureteric bud
D. Minor calyx
E. Collecting tubule

9. The glandular urethra (of glans) originates from

A. endoderm of urogenital ^{sinus} origin. - rest of urethra
(B) ectodermal invagination.
C. neuroectodermal invagination.
D. mesoderm surrounding the glans.
E. an extension of the urethral plate endoderm. ~~ectoderm~~

10. Which of the following sequences correctly describes the development of the anterior lobe of the pituitary?
- A. Stomodeal ectoderm → pars intermedia → anterior pituitary
 - B. Oral cavity endoderm → Rathke's pouch → anterior pituitary
 - C. Surface ectoderm → neurohypophysis → anterior pituitary
 - ☒ D. Stomodeal ectoderm → Rathke's pouch → anterior pituitary
 - E. Neuroectoderm → infundibulum → anterior pituitary
11. Which of the following statements regarding the gubernaculum is NOT TRUE?
- A. Forms the ovarian round ligament. ✓
 - B. Forms the uterine round ligament. ✓
 - ☒ C. Forms the ovarian suspensory ligament.
 - D. Has also been called the inguinal ligament of the mesonephros. ✓
 - E. Its terminal end is found in the wall of the scrotal sac and labia majora. ✓
12. A woman who gained relatively little weight during pregnancy gives birth to an infant with large, low-set ears; a flattened nose; wide interpupillary space and receding chin (Potter's facies). The infant is under great distress and dies in two (2) days. Your diagnosis is:
- A. Unilateral renal agenesis.
 - ☒ B. Bilateral renal agenesis.
 - C. Pelvic kidneys.
 - D. Polycystic kidneys.
 - E. Polyhydramnios.
- Oligohydramnios*
13. An adult, mature male saw his physician regarding a swelling in the right side of his scrotum. Physical examination revealed a small moveable swelling about pea size above the upper pole of the testis. It was diagnosed as a cyst of the appendix of the testis. This is an embryological remnant of the
- A. mesonephric duct.
 - ☒ B. paramesonephric duct.
 - C. mesonephric tubules.
 - D. urogenital sinus.
 - E. gubernaculum.
14. When the trigone of the urinary bladder first forms it consists of tissue derived from the
- A. ureteric buds.
 - B. mesonephric tubules.
 - ☒ C. mesonephric ducts.
 - D. splanchnopleuric lateral plate mesoderm.
 - E. Endoderm of the primitive urogenital sinus.

15. The immediate precursor of the vestibule is

- A. Sinovaginal bulbs.
- B. Pelvic urethra.
- C. Labioscrotal swellings.
- D. Sinosal tubercle.
- ☒ E. Definitive urogenital sinus.

16. Which of the following sequences correctly describes the development of the labia minora?

- ☒ A. Cloacal folds → urethral folds → labia minora
- B. Cloacal folds → labioscrotal swellings → labia minora
- C. Urethral folds → cloacal folds → labia minora
- D. Urethral folds → labioscrotal swellings → labia minora
- E. Labioscrotal swellings → urethral folds → labia minora

17. During the indifferent phase of genital development, both male and female embryos possess mesonephric and paramesonephric ducts and have primitive sex cords in the developing gonads. Which of the following choices best describes the fates of these four (4) elements in the two sexes?

	Medullary primitive sex cords (Male)	Medullary primitive sex cords (female)	Mesonephric ducts (male)	Paramesonephri ducts (female)
A.	Give rise to Sertoli cells	Give rise to ovarian follicle cells	Regress	Regress
B.	Give rise to Leydig cells	Give rise to ovarian follicle cells	Regress	Give rise to uterus
C.	Regress	Regress	Give rise to vas deferens	Regress
<input checked="" type="radio"/> D.	Give rise to Sertoli Cells	Regress	Give rise to vas deferens	Give rise to uterus
E.	Regress	Give rise to ovarian follicle cells	Regress	Give rise to uterus

18. The zona fasciculata of the ~~adrenal gland~~ traces its origin to:
- A. fetal cortex.
 - B. neural crest cells.
 - C. development of the zona reticularis.
 - ☒ D. primordium of the permanent cortex.
 - E. invasion of germinal epithelial cells.
19. The differentiation of the male genital system is controlled by a cascade of hormones and factors, which is initiated by the expression of the sex-determining region of the Y chromosome (SRY). Which of the following choices best describes this sequence of control substances and their sites of origin and action?
- A. TDF → Leydig cells → MIS → pre-Sertoli cells → testosterone
 - B. TDF → Leydig cells → MIS → pre-Sertoli cells → testosterone
 - ☒ C. TDF → pre-Sertoli cells → MIS → Leydig cells → testosterone
 - D. MIS → Leydig cells → TDF → pre Sertoli cells → testosterone
 - F. MIS → pre-Sertoli cells → TDF → Leydig cells → testosterone
20. Which of the following choices include only organs that initially form as endodermal buds of the primitive gut tube or its derivatives?
- urogenital sinus*
- A. Bulbourethral glands, prostate gland, ~~superior end of vagina~~
 - B. Bulbourethral glands, seminal vesicles, superior end of vagina
 - C. Prostate gland, seminal vesicles, inferior end of vagina
 - D. Seminal vesicles, bulbourethral glands, inferior end of vagina
 - ☒ E. Prostate gland, bulbourethral glands, inferior end of vagina

For the short case histories in items 21-25, select from the following list, one disorder that is most consistent with the findings described.

- A. 5α -reductase deficiency (Male pseudohermaphroditism)
 - B. Female pseudohermaphroditism
 - C. Klinefelters syndrome
 - D. Secondary hypogonadism
 - E. Testicular feminization syndrome
21. A 19-year old individual who has failed to enter puberty has a penis, a scrotum containing small testes, no vagina, well-developed breasts, unusually long extremities and is infertile. Pituitary and hypothalamic secretions of gonadotropins is at a high level. Karyotype is 47, XXY.
- ☒ C

22. An infant ~~has~~ lacks uterine tubes and a uterus but has a small blind-ending vagina. The infant's karyotype is 46, XY. Testes are present but are found in the labial area. There is no spermatogenesis. Male steroid levels are normal.

(E)

23. An individual has external genitalia that appear male except that the scrotum does not contain testes. Ultrasound reveals the presence of a vagina, uterus and uterine tubes. The individual's karyotype is 46, XX. Buccal smear was chromatin positive.

(B)

24. An adolescent who has appeared to be a normal girl suddenly exhibits phallic enlargements and a breaking voice. Neither menarche nor breast development has occurred. The individual has high concentrations of testosterone but lacks dihydrotestosterone.

(A)

25. A young boy failed to undergo developmental changes with puberty. His testes were found to be small and testosterone levels were measurable but low. In addition, there were depressed levels of gonadotropins as were secretions of gonadotropin-releasing hormone (from hypothalamus).

(D)

26. A 2-year-old boy was taken to a pediatrician due to a swelling of the right side of the scrotum. The scrotum was found to be swollen with the swelling situated anterior to the right testis. Both testes were normal and in the scrotum. No intestinal contents were felt in the scrotal sac. Your diagnosis is:

(E)

- A. Congenital hernia
- B. Cystic paradidymis
- C. Urachal cyst
- D. Cryptorchidism
- E. Hydrocele

27. Which of the following endocrine glands is not of endodermal origin?

(A)

- A. Pineal gland
- B. Thyroid gland
- C. Parathyroid gland
- D. Ultimobranchial body
- E. Pancreatic islets

28. Absence of the vagina and fornices would be related to developmental failure of:
- A. Gartner's duct
 - B. Urogenital folds
 - C. Mesonephric ducts
 - ☒ D. Paramesonephric ducts
 - E. Sinovaginal bulbs and plate
29. Oxyphil (chief) cells of the superior parathyroid come from cells that originate from:
- A. 1st pharyngeal pouch
 - B. 2nd pharyngeal pouch
 - C. 3rd pharyngeal pouch
 - ☒ D. 4th pharyngeal pouch
 - E. Foramen cecum region of future tongue
30. The pars tuberalis of the hypophysis (pituitary gland) takes its origin from:
- ☒ A. Rathke's pouch
 - B. Neuroectodermal infundibulum
 - C. Mesodermal tissue
 - D. Thyroglossal duct
 - E. Roof of the diencephalon
31. Thymic gland migration usually is accompanied by migration of:
- A. Thyroid gland
 - B. Superior parathyroid gland
 - ☒ C. Inferior parathyroid gland
 - D. Ultimobranchial body
 - E. Infundibulum of the pituitary gland
32. A condition of chordee of the penis is usually associated with:
- a. Epispadias
 - ☒ B. Hypospadias
 - C. Bladder exstrophy
 - D. Congenital absence of the penis
 - E. Congenital inguinal hernia

~~Both factors, Tamm-Horsfall glycoprotein, uvomorulin,~~
and laminin are all related to the development of the:

- A. Ureteric bud
- B. Collecting ducts
- ☒ C. Nephron
- D. Renal pelvis
- E. Renal calyces

34. A 12-year-old girl was taken to a pediatrician because she experienced cyclic pain, but there was no actual menstrual flow. On examination of the vulva, the hymen was seen as a bulging septum. No vaginal orifice was seen. Diagnosis was imperforate hymen due to failure of the vaginal plate to degenerate. The plate originates from:

- A. Mesonephric duct
- ☒ B. Urogenital sinus
- C. Paramesonephric duct
- D. Urogenital folds
- E. Duct of Gartner

For questions 35-38, indicate the tissue of origin for each structure.

- A. Ureteric bud - metanephric diverticulum
- B. Metanephric blastema (intermediate mesoderm)
- C. Both A and B are correct
- D. Neither A nor B are correct

☒ B 35. Distal convoluted tubule B

☒ D 36. Membranous urethra D

☒ D 37. Vestibular glands D

☒ A 38. Renal pelvis A

39. Which of the following structures are sensitive to dihydrosterone in their development?

- ☒ A. Genital tubercle
- B. Vas deferens
- C. Epididymis
- D. Seminal vesicle
- E. Paramesonephric duct

All but one of the following statements are correct **EXCEPT**:

- A. Polycystic kidneys can be caused by a lack of connection between tubular part of nephron and collecting duct system.
- ☒ B. Horseshoe kidney's are typically fused at their superior poles interfering with their cephalic migration.
- C. Migration of a horseshoe kidney is usually impeded by the ^{inferior} mesenteric artery.
- D. Many variants of duplications of the ureter have been described and are not always damaging.
- E. The normal counterpart of a hypoplastic kidney is likely to undergo compensatory hypertrophy.

41. Which of the following does not belong in the group

- A. Ascending colon
- ☒ B. Duodenum - *foregut*
- C. Jejunum *Midgut*
- D. Ileum
- E. Right portion of transverse colon

42. Which of the following does not belong in the group

- A. Hepatocytes
- ☒ B. Epithelial cells of body and tail of pancreas
- C. Epithelial cells of common bile duct
- D. Epithelial cells of gall bladder
- E. Epithelial cells of majority of head of pancreas

43. Which of the following does not belong in the group

- A. Epithelial cells of blood vessels (endothelium)
- B. Epithelial cells of endometrium
- ☒ C. Epithelial cells of mammary gland
- D. Epithelial cells of peritoneum
- E. Epithelial cells of ureter

44. Which of the following does not belong in the group

- ☒ A. Blood
- B. Sweat
- C. Tears

45. Which of the following does not belong in the group

- A. Anterior premuscle mass of limb (flexor digitorum profundus)
- ☒ B. Epaxial muscles (Erector spinae)
- C. Hypaxial muscles (External abdominal oblique muscle)
- D. Posterior premuscle mass of limb (extensor digitorum longus)

46. Which of the following does not belong in the group

- ☒ A. Section of digestive tract that includes the anal canal and external anal orifice
- B. Section of digestive tract that includes the descending colon and sigmoid colon junction
- C. Section of digestive tract that includes the duodenum and jejunum junction
- D. Section of digestive tract that includes the jejunum and ileum junction
- E. Section of digestive tract that includes the rectum and anal canal junction

47. Abnormalities in cartilage growth would be least demonstrated in which of the following?

- A. Carpal bone
- B. Humerus
- C. Occipital bone
- ☒ D. Parietal bone
- E. Vertebral body

48. Smooth muscle forms in mesenchyme of

- A. branchial arch mesenchyme.
- B. lateral plate somatic mesoderm.
- C. lateral plate splanchnic mesoderm.
- D. A and B above are correct.
- ☒ E. A, B, and C above are correct.

49. Skeletal muscle does not usually form in

- A. branchial arch mesenchyme.
- B. lateral plate somatic mesoderm.
- ☒ C. lateral plate splanchnic mesoderm.
- D. myotome portions of somites.

50. A typical vertebra is said to possess ____ primary ossification

- A. one
- ☒ B. three
- C. five
- D. six
- E. nine

51. Interzonal mesenchyme of joints within the limbs

- ☒ A. gives rise to the synovial membrane of the joint.
- B. gives rise to the articular cartilage of the joint.
- C. gives rise to the epiphysis.
- D. A and B are correct.
- E. A, B, and C are correct.

52. The integument is composed of tissue derived from

- A. ectoderm.
- B. mesoderm.
- C. endoderm.
- ☒ D. A and B are correct.
- E. A, B, and C are correct.

QUESTIONS 53 TO 57

- A. Majority of organ possess a peritoneal mesentery
- B. Majority of organ is secondarily retroperitoneal
- ✓ C. Majority of organ is extraperitoneal (primary retroperitoneal)
- D. None of the above

- ☒ B 53. Ascending colon B
- ☒ D 54. Esophagus D
- ☒ C 55. Kidney C
- ☒ A 56. Sigmoid colon A
- ☒ A 57. Spleen A

QUESTIONS 58 TO 60

- A. Ventral (flexor) premuscle mass of limb bud
- B. Dorsal (extensor) premuscle mass of limb bud
- C. Both A and B are correct
- D. Neither A nor B is correct

- ☒ 58. Muscles in anterolateral thigh of adult (quadriceps femoris)
- ☒ 59. Intrinsic muscles of hand (dorsal interossei, etc.)
- ☒ A 60. Muscle posterior to the knee (popliteus)

QUESTIONS 61 TO 63

- A. Congenital condition
- B. Non-hereditary, postnatal condition that develops before skeletal maturation
- C. Non-hereditary, postnatal condition that develops after skeletal maturation

- ☒ 61. Acromegaly
- ☐ 62. Achondroplasia
- ☐ 63. Talipes equinovarus

QUESTIONS 64 TO 68

You are working in a small clinic in an impoverished area. A young woman brings her one-week-old baby, whom she and her mother delivered, to be seen because the "belly button" "doesn't look right". She says that she is breast-feeding the baby. As you examine the neonate you notice that the umbilical stump and diaper covering it are wet. When the baby cries, you notice that fluid collects at the end of the umbilical stump.

64. Possible anomalies producing this condition include

- A. an ileal (Meckel's) diverticulum. *Remnant of yolk stalk*
 - B. an urachal sinus. *open at umbilicus or bladder*
 - C. an urachal cyst. *crypt in urachus*
 - ☒ D. A and B are correct.
 - E. A, B, and C are correct.
- ulceration may be connected to umbilicus w/ umbil. cord fistula*

65. Assuming that the fluid that collects at the end of the umbilical stump is somewhat opaque, yellowish in color, and has bubbles in it you should focus your thoughts on which of the following anomalies?

- A. Urachal fistula - *urine*
- ☒ B. Ileo-umbilical fistula
- C. Umbilical sinus
- D. A and B are correct
- E. A, B, and C are correct

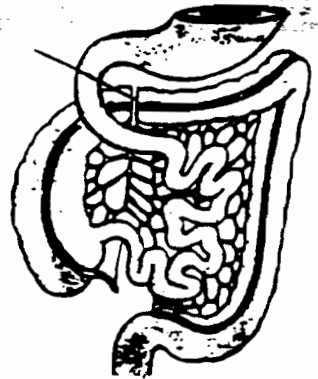
Chyme
- Bubbles.

66. Assuming that the fluid that collects at the end of the umbilical stump is somewhat opaque, yellowish in color, and has bubbles in it you should tell the young mother that
- A. This condition may produce an intestinal obstruction, so be very observant of the baby's eating and general behavior.
 - B. This condition should best be corrected surgically.
 - C. This condition is a minor mistake of nature, it will heal on its own, don't worry about it.
 - ☒ D. A and B are correct
 - E. A, B, and C are correct
67. Assuming that the fluid that collects at the end of the umbilical stump as long as you apply pressure to the abdominal wall is clear and yellowish tinted, you should focus your thoughts on which of the following anomalies?
- ☒ A. Urachal fistula
 - B. Urachal cyst
 - C. Ileo-umbilical fistula
 - D. A and B are correct
 - E. A, B, and C are correct
68. Assuming that the fluid that collects at the end of the umbilical stump as long as you apply pressure to the abdominal wall is clear and yellowish tinted, you should tell the young mother that
- A. This condition may produce an intestinal obstruction, so be very observant of the baby's eating and general behavior.
 - ☒ B. This condition should best be corrected surgically.
 - C. This condition is a minor mistake of nature, it will heal on its own, don't worry about it.
 - D. A and B are correct.
 - E. A, B, and C are correct.

QUESTIONS 69 TO 70

69. This diagram illustrates a result that includes

- A. normal rotation of the midgut
- B. nonrotation of the midgut
- ☒ C. reverse rotation of the midgut
- D. congenital volvulus



70. If this person were to develop appendicitis, the referred pain from the inflamed appendix would be found

- ☒ A. in dermatomes situated more superiorly than you would anticipate
- ☐ B. in the same dermatomes that you would anticipate
- C. in dermatomes situated more inferiorly than you would anticipate
- D. to be non-existent

QUESTIONS 71 TO 72

71. This diagram illustrates a result that includes

- ☒ A. normal rotation of the midgut
- ☐ B. nonrotation of the midgut
- C. reverse rotation of the midgut
- D. congenital volvulus



72. If this person were to develop appendicitis, the referred pain from the inflamed appendix would be found

- A. in dermatomes situated more superiorly than you would anticipate.
- ☒ B. in the same dermatomes that you would anticipate.
- C. in dermatomes situated more inferiorly than you would anticipate.
- D. to be non-existent.

[REDACTED]

You are helping in a family physician's office/clinic. A patient comes in complaining of "a pain in the rectum" as he stands in the waiting room. When you examine the patient you observe some inflamed tissue around a oozing tear in the skin of the anal canal and some inflamed, pendulous hemorrhoids hanging into the anal canal. As you gently press on the hemorrhoids in order to move them the patient answers your question related to the length of time of the pain as being "About one week". When you press on the fissure in the skin the patient squirms uncomfortably and says "OUCH!".

73. The lymphatic fluid from the tissue surrounding the hemorrhoids will drain most directly into the
- A. superficial inguinal nodes.
 - ☒ B. pararectal and internal iliac nodes.
 - C. Both A and B are correct.
 - D. Neither A nor B is correct.
74. The lymphatic fluid from the tissue surrounding the fissure will drain most directly into the
- Proctodeum*
- ☒ A. superficial inguinal nodes.
 - B. pararectal and internal iliac nodes.
 - C. Both A and B are correct.
 - D. Neither A nor B is correct.
75. The sensory nerve endings in the tissue surrounding the hemorrhoids relate to the
- ☒ A. general visceral afferent neurons of the nervous system.
 - B. general somatic afferent neurons of the nervous system.
 - C. Both A and B are correct.
 - D. Neither A nor B is correct.
76. The blood within the hemorrhoids most likely reached them via branches of the
- Superior mesenteric artery.*
- A. superior mesenteric artery.
 - ☒ B. inferior mesenteric artery.
 - C. Both A and B are correct.
 - D. Neither A nor B is correct.

The bloody fluid that is oozing from the fissure most likely reached it via branches of the

- A. superior mesenteric artery.
- B. inferior mesenteric artery.
- C. Both A and B are correct.
- (D) Neither A nor B is correct.

internal iliac
internal pudendal
(inferior mesal)

QUESTIONS 78 TO 80

INDICATE THE PROPER LOCATION OF THE NERVE CELL BODIES OF THE NEURONS DESCRIBED IN THE QUESTIONS

- A. Dorsal motor nucleus of vagus (vagus nerve)
- B. Sacral spinal cord (pelvic splanchnic nerves)
- C. Thoracic spinal cord (thoracic splanchnic nerves)
- D. Lumbar spinal cord (lumbar splanchnic nerves)
- E. None of the above

(E) 78. Postganglionic sympathetic neurons innervating stomach and duodenum

(A) 79. Preganglionic parasympathetic neurons innervating majority of transverse colon
*preganglionic foregut → thoracic postganglionic ganglia
midgut → thoracic splanchnic
→ Vagus (parasympathetic)*

(E) 80. Visceral afferent neurons stimulated by an ulcer in the duodenum
Dorsal horn T5-T9

81. Evaluation in the nursery of a neonatal full-term male reveals, in your judgment, signs of severe cyanosis. Mental review of the development of the heart reminds you that the most likely cause of cyanosis to the degree seen in this infant is

- A. a right aortic arch.
- B. patent ductus arteriosus.
- (C) large interventricular septal defect.
- D. post-ductal coarctation of the aorta.
- E. maldevelopment of septum secundum.

82. Intrauterine closure of the right-to-left shunt of blood across the interatrial septum during the second trimester is
- ☒ A. incompatible with survival.
 - B. normal.
 - C. one of the most common cardiovascular developmental defects.
 - D. usually associated with failure of the endocardial cushions to fuse.
 - E. commonly called a septum II type of arterial septal defect.
83. The presence of a patent left sixth embryonic aortic arch at the time of birth would
- A. create an abnormal branching pattern of vessels derived from the arch of the aorta.
 - B. cause the right subclavian artery to branch from the ascending aorta.
 - C. contribute to an asymmetrical division of the truncus arteriosus.
 - D. contribute to an abnormal course for the left recurrent laryngeal nerve.
 - ☒ E. be expected.
84. All of the following would be expected to be present at 6 weeks of development except
- A. Endocardial cushions
 - B. Segmental (tertiary) bronchi
 - ☒ C. Surfactant
 - D. Septum secundum
 - E. Muscular portion of interventricular septum
85. All of the following are components of the developmental defect known as tetralogy of Fallot **EXCEPT**
- A. Pulmonary trunk stenosis
 - B. Interventricular septal defect
 - C. Right ventricular hypertrophy
 - ☒ D. Hypoplastic (very small, nonfunctional) left ventricle
 - E. Over-riding aorta (aorta sits directly over the interventricular septum)
86. Adult structures derived from the sinus venosus include all of the following **EXCEPT**
- A. Sinoatrial node
 - ☒ B. Great cardiac vein
 - C. Coronary sinus
 - D. A portion of the right atrial wall
 - E. Crista terminalis

Questions 87 to 91 match the adult structure with its counterpart. A choice may be used once, more than once, or not at all.

- A. Superior vena cava
- B. A portion of the inferior vena cava
- C. Ligamentum teres hepatis
- D. Left pulmonary veins
- E. Disappears; no adult remnant

- ☒ 87. Proximal right vitelline vein
- ☒ 88. Distal left vitelline vein
- ☒ 89. Distal left umbilical vein
- ☒ 90. Right common cardinal vein
- ☒ 91. Subcardinal veins ☒

92. All of the following are true of the heart at end of third week of development **EXCEPT**. It is

- A. anchored on its outflow (arterial) end by the embryonic aortic arches as they traverse the branchial arches.
- B. anchored on its inflow (venous) end by cardinal veins as they traverse the septum transversum.
- C. located ventral to the foregut.
- ☒ D. paired.
- E. beating.

93. Breakdown of the dorsal mesocardium creates the

- ☒ A. transverse pericardial sinus.
- B. oblique pericardial sinus.
- C. coronary sinus.
- D. membranous interventricular septum.
- E. sinus venarum.

Questions 92 to 96

- A. Paraxial mesoderm (somites)
- B. Lateral plate mesoderm
- C. Intermediate mesoderm
- D. A and B are correct
- E. A, B, and C are correct

B C A
(Hy) (10) (M B S)
somite myotome
somite sclerotome
dermatome

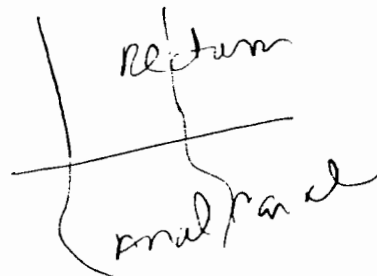
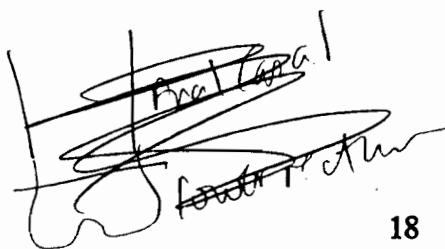
- A* 92. Vertebral column *A*
- 93. Deep muscles of the back (Extensors) *A*
- 94. Anterolateral muscles of trunk (Flexors) *A*
- B* 95. Muscles of forearm *A*
- 96. External urethral sphincter *A*

Questions 97 to 100

- A. Carcinoma of lower rectum
- B. Carcinoma of lower anal canal
- C. Both A and B are correct
- D. Neither A nor B is correct

anal canal
rect

- A* 97. Metastatic to inferior mesenteric nodes *B*
- B* 98. Metastatic to pudendal nodes *A*
- B* 99. Usually painful during defecation *A*
- A* 100. May cause discomfort, but not pain, during defecation *B*



Name: [REDACTED] EMBRYOLOGY 96/7 Course #: EMBRY967
Date: [REDACTED]

	B		A		
Test Key:	BDDCADDCE	CBBEEBABAC	DBCACBC CD	AECCBCACEB	ADDBDDEAAB
Items 1-50:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*C*B****D	D*****D	****B** *A	*****A*B*E	D*E*****

Test Key:	ECDADBDECA	CBDDDBDAAA	ABDBACBBBB	BBBBBAAABB	BBDCCCBABA
Items 51-100:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*****C*****	*****A**	*****A**	*****A**	*****DE**B

EXAM 1 Form A

Possible Points: 99
Raw Score: 82